

Cristina Castanha is an assistant research scientist at the University of California, Berkeley and a senior research associate at Lawrence Berkeley National Laboratory. She is an ecologist and biogeochemist who studies the effects of climate change and other anthropogenic influences on vegetative land cover and the terrestrial carbon cycle. For the past five years she has been studying conifer seedling demographics in Colorado's Front Range. And over the past seventeen years she has worked in a variety of locations and on a series of collaborations investigating the controls on carbon cycling in terrestrial ecosystems. Her work uses natural environmental gradients, field experiments, isotope analyses, and laboratory analyses. Cristina holds a B.S. in Fermentation Science from UC Davis (1985), an M.S. in Environmental Systems from Humboldt State University (1992), and a Ph.D. in Energy and Resources from UC Berkeley (2004). At UC Berkeley she served as lecturer in Environmental Sciences and as teaching assistant for a variety of classes including Environmental Problems, Development and Classification of Soils, and Renewable Resources for Electrical Generation.

EDUCATION

- Ph.D. **University of California Berkeley.** Energy and Resources, 2004.
Mineral and Climate Controls on Soil Organic Matter Storage and Cycling.
John Harte (chair), Ronald Amundson, Susan Trumbore, and Richard Norgaard
- M.S. **Humboldt State University.** Environmental Systems, 1994.
The USA/Brazilian Rural Electrification Pilot Program; a technical and economic analysis. Robert Gearhart
- C.S. **Sonoma State University.** Energy Management and Design, 1992.
- B.S. **University of California Davis.** Fermentation Science, Honors, 1985.

RESEARCH AND PROFESSIONAL EXPERIENCE

Principal Research Associate, Earth Sciences Division, LBNL. 2012-present.
Senior Research Associate, Earth Sciences Division, LBNL. 2005-2012.
Assistant Research Scientist, University of California, Berkeley 2008-present
Lecturer, Environmental Science Senior Research Seminar, UC Berkeley 2004-5.
Outstanding Graduate Student Instructor, UC Berkeley 2001.
GSI, UC Berkeley, 1994-2004: Quantitative Aspects of Environmental Problems (Harte),
Summer Soil Field Course (Amundson/Singer/Dahlgren), Development and Classification of
Soils (Amundson), Field Study of Soil Development (Amundson), Renewable Resources for
Electrical Generation (Morris).
Assistant Winemaker, Michel-Schlumberger Wines. 1985-1991.

PEER REVIEWED PUBLICATIONS

Castanha C, S Trumbore, R Amundson. 2008. Methods of separating soil carbon pools affect the chemistry and turnover time of isolated fractions. *Radiocarbon* 50(1): 83-97.

Castanha C, S Trumbore, R Amundson. 2012. Mineral and organic matter characterization of density fractions of basalt- and granite-derived soils in montane California. In: *An Introduction to the Study of Mineralogy*. Aydinalp C, ed. InTech.

Castanha C, MS Torn, MJ Germino, B Weibel, LM Kueppers. 2012. Conifer seedling recruitment across a forest-to-alpine tundra gradient and effects of provenance. *Plant Ecology and Diversity*. DOI:10.1080/17550874.2012.716087.

Reinhardt K, C **Castanha**, MJ Germino, LM Kueppers. 2011. Ecophysiological variation in two provenances of *Pinus flexilis* seedlings across an elevation gradient from forest to alpine. *Tree Physiology*, 31(6): 615-625.

Moyes AB, C **Castanha**, MJ Germino, LM Kueppers. 2012. Warming and the dependence of limber pine (*Pinus flexilis*) establishment on summer soil moisture within and above its current elevation range. *Oecologia*, 171(1): 271-282.

Torn MS, CW Swanston, C **Castanha**, SE Trumbore. 2009. Storage and turnover of organic matter in soil. LBNL-810E. In: *Biophysico-Chemical Processes Involving Natural Nonliving Organic Matter in Environmental Systems*, Senesi N, Xing B, and Huang PM, eds., International Union of Pure and Applied Chemistry (IUPAC), New York, NY.

St. Clair, S, SM Bernard, EA Sudderth, C **Castanha**, MS Torn, D. Ackerly. 2009. Plant responsiveness to soil moisture and nitrogen is consistent across the functional diversity of a California annual grassland. *Journal of Vegetation Science*, 20(5): 860–870.

Swarbreck SM, EA Sudderth, SB St.Clair, R Salve, C **Castanha**, MS Torn, DD Ackerly, GL Andersen. Linking leaf transcripts levels to whole plant analyses provides mechanistic insights to the impact of warming and altered water availability in an annual grass. 2011. *Global Change Biology*, 17(4): 1577–1594.

Sudderth EA, SB St.Clair, S Placella, SM Swarbreck, C **Castanha**, DJ Herman, ML Fischer, M Kleber, EB Sudderth, MS Torn, MK Firestone, GL Andersen, DD Ackerly. 2012. Timing of dry periods relative to plant phenological stage has larger impacts on grassland systems than annual rainfall. *Ecosphere*.

PUBLISHED ABSTRACTS

Lim, HC, M Bill, C Castanha, J Ceja-Navarro, MS Conrad, MWI Schmidt, S Abiven, MS Torn, JK Jansson and EL Brodie. 2012. The Role of Actinobacteria in Biochar Decomposition in a Mediterranean Grassland Soil. AGU, General Meeting. San Francisco, CA.

Reinhardt K, MJ Germino, LM Kueppers, J Mitton, C Castanha. 2012. Why Seedlings Die: Linking Carbon and Water Limitations to Mechanisms of Mortality During Establishment in Conifer Seedlings. AGU, General Meeting. San Francisco, CA.

Kueppers LM, C Castanha, AB Moyes, MJ Germino, and MS Torn. 2012. Alpine Treeline Warming Experiment: Effects of Microclimate on Subalpine Seedling Establishment within and Beyond Two Species' Current Elevation Ranges. MtnClim 2012, Estes Park, CO.

Taş N, C Castanha, K Reichl, M Fischer, EL Brodie, MS Torn, JK Jansson. 2012. Carbon Biosequestration Potential and Microbial Stimulation by Pyrolyzed Carbon (Biochar) in Soil. ISME14.

Castanha C, AB Moyes, MS Torn, MJ Germino, LM Kueppers. 2011. Responses of subalpine conifer seedling germination and survival to soil microclimate in the Alpine Treeline Warming Experiment. AGU, General Meeting. San Francisco, CA.

Kueppers LM, AB Moyes, SM Ferrenberg, DS Christianson, C Castanha, MJ Germino. 2011. Manipulation of subalpine and alpine climate in the Alpine Treeline Warming Experiment. AGU, General Meeting. San Francisco, CA.

Reinhardt K, C Castanha, MJ Germino, LM Kueppers. 2011. Leapfrogging of tree species provenances? Interaction of microclimate and genetics on upward tree shifts in tree species range limits. AGU, General Meeting. San Francisco, CA.

Billesbach DP, ML Fischer, DR Cook, MS Torn, C Castanha. 2011. Establishment of a new, cooperative ARM and AmeriFlux site on the Alaskan North Slope. AGU, General Meeting. San Francisco, CA.

Kueppers, LM., C Castanha, AB Moyes, S Ferrenberg, MS Torn, MJ Germino. 2011. Alpine Treeline Warming Experiment: An Experimental Test of Climatic Constraints to Subalpine Tree Species' Recruitment Ranges. Interface 1st INTERFACE meeting: How Do We Improve Earth System Models? Integrating Earth System Models, Ecosystem Models, Experiments and Long-Term Data, Captiva Island, FL.

Castanha C, MJ Germino, MS Torn, SM Ferrenberg, J Harte, LM Kueppers. 2010. Subalpine conifer seedling demographics: Species responses to climate manipulations across an elevational gradient at Niwot Ridge, Colorado. AGU, General Meeting. San Francisco, CA.

Moyes AB, C Castanha, S Ferrenberg, MJ Germino, LM Kueppers. 2010. Sensitivity of limber pine (*Pinus flexilis*) seedling physiology to elevation, warming, and water availability across a timberline ecotone. AGU, General Meeting. San Francisco, CA.

Reinhardt K, C Castanha, MJ Germino, LM Kueppers. 2010. Provenance-level variation in mobile carbon pools corresponds to variation in ecophysiology, growth, and survival in *Pinus flexilis* seedlings from forest to alpine. ESA, Annual Meeting.

Castanha C, B Weibel, MS Torn, MJ Germino, LM Kueppers. 2009. Subalpine conifer seedling demographics across an elevational gradient at Niwot Ridge, Colorado: Comparison of site, species, and provenance. AGU, General Meeting. San Francisco, CA.

Kueppers LM, A Faist, C Castanha. 2009. Population and species differences in treeline tree species germination in response to climate change. AGU, General Meeting. San Francisco, CA.

St.Clair SB, SM Bernard, C Castanha, EA Suddereth, MS Torn, MK Firestone, DD Ackerly. 2007. The influence of cumulative and temporal variation in soil moisture on California grassland plant processes. ESA, Annual Meeting.

Torn MS, SM Bernard, SB St.Clair, ML Fischer, FM Hopkins, SA Placella, C Castanha, EA Suddereth, DJ Herman, R Salve, DD Ackerly, MK Firestone. 2007. Linking the response of annual grasslands to warming and altered rainfall across scales of gene expression, species, and ecosystem. AGU, General Meeting. San Francisco, CA.

Torn MS, SB St.Clair, DD Ackerly, GL Andersen, SM Bernard, EL Brodie, C Castanha, MK Firestone, ML Fischer, DJ Herman, FM Hopkins, SA Placella, R Salve. 2007. Annual grassland response to altered precipitation and temperature: Genes, species, and ecosystem. ESA, Annual Meeting.

Castanha C, AB Smith, S Carey. 2007. Soil properties influence plant species abundance and diversity in a California serpentine grassland. ESA, Annual Meeting.

Castanha C, SE Trumbore, RG Amundson. 2004. The integrated effects of climate and parent material on soil C cycling in California. ESA, Annual Meeting.

Castanha C, RG Amundson. 2002. The role of mineralogy on the turnover time of organic carbon in a volcanic soil in the southern Cascades, California. AGU, General Meeting. San Francisco, CA.

COLLABORATORS

Ackerly DD¹, Amundson RG¹, Andersen GL², Billesbach DP³, Brodie EL², Carey S, Faist A⁴, Ferrenberg SM⁴, Firestone MK¹, Fischer ML², Germino MJ^{5,6}, Harte J¹, Herman DJ¹, Hopkins FM⁷, Jansson JK², Kueppers LM⁸, Moyes AB⁸, Nico PS², Placella SA⁹, Reichl K², Reinhardt K⁶, Salve R², Smith AB¹⁰, St.Clair S¹¹, Suddereth E¹², Swanston CW¹³, Swarbreck SM, Tas N², Torn MS^{1,2}, Trumbore SE^{7,14}, Weibel B¹⁵.

¹UC Berkeley

²Lawrence Berkeley National Lab

³University of Nebraska, Lincoln

⁴University of Colorado, Boulder

⁵United States Geologic Survey, Boise

⁶Idaho State University

⁷University of California Irvine

⁸University of California Merced

⁹Michigan State University

¹⁰Missouri Botanical Garden

¹¹Brigham Young University

¹²Brown University

¹³United States Department of Agriculture, Forest Service, Northern Research Station

¹⁴Max Planck Institute for Chemical Ecology, Jena, Germany

¹⁵Federal Office of Meteorology and Climatology MeteoSwiss, Zurich, Switzerland

GRADUATE AND POSTDOCTORAL ADVISORS AND ADVISEES

Torn MS, LBNL and UC Berkeley; Weibel B, University of Zurich.